IN THE SPECIFICATION

The paragraph beginning at page 6, line 26 is amended as follows:

FIG. **21** is a schematic illustration of an example of a list of points along a calculated centerline where the line passing through them describes an angle [[?$_v$]] $\underline{\theta_v}$.

The paragraph beginning at page 24, line 9 is amended as follows:

At **906**, topological violations are optionally eliminated (unless, for example, it is desired to extract an entire vessel tree, in which case elimination of topological violations is not performed). One example of a topological violation is a Y-shaped centerline condition, such as is illustrated schematically in FIG. **21**. Y-shaped centerline conditions may occur when the seed **2101** is ambiguous (such as near a bifurcation in the vessel). In such a case, the endpoints of the centerline may be located in different branches of the vessel. Detecting this condition involves finding the angle [[(?$_s$)]] $\underline{(\theta_s)}$ **2102** subtended at the seed **2101** by the vectors from the seed **2101** to points on the centerline that are located a few extracted incremental segments away from the seed, as shown in FIG. **21** at **2103** and **2104**. If the value of the angle **2102** is below a certain threshold [[(?$_{min}$)]] $\underline{(\theta_{min})}$, then the propagation has resulted in a Y-shaped centerline.

The paragraph beginning at page 25, line 1 is amended as follows:

In one example, the threshold [[(?$_{min}$)]] $\underline{(\theta_{min})}$ is predetermined, such as to a default value, but which may vary (e.g., using a lookup table or a stored human body atlas), such as using a user-specified parameter identifying the vessel of interest or identifying the actual value of the threshold [[(?$_{min}$)]] $\underline{(\theta_{min})}$.

The paragraph beginning at page 29, line 12 is amended as follows:

The vessel departure check uses a cylindrical model of the vessel, which is completely characterized by its radius (r) and height (h). The approximate diameter of the vessel at the seed is estimated at **1502** using Principal Component Analysis (PCA). The maximum geodesic distance increases monotonically after every update and is approximately equal to one half the height of the cylinder (i.e., $h=2 \cdot d_{max}$). At **1503**, vessel departure occurs when the rate (R) at which the height increases falls below a predetermined threshold (R_{min}). The rate R is the ratio of the increase in maximum geodesic distance [[(?d_{max})]] ($\underline{\Delta d_{max}}$) and the front iteration interval [[(?i)]] ($\underline{\Delta i}$) over which the increase has been observed. In one example, the iteration interval is calculated adaptively based on the current value of d_{max} and the total number of updates:

$$\text{Interval [[?i]]} \ \underline{\Delta i} = N_u = N_c - N_f$$

where N_u is the number of unfilled voxels in the cylinder, N_c is the estimated total number of voxels in the cylinder and N_f is the number of filled voxels. N_f is given by the total number of iterations and N_c is calculated as:

$$N_c = \text{Volume of cylinder / Volume per voxel}$$

$$\text{Volume of cylinder} = 2\pi r^2 d_{max}$$

Conclusion

Applicant respectfully requests that the preliminary amendment described herein be entered into the record prior to examination and consideration of the above-identified application. Applicant submits that this amendment merely corrects typographical errors in printer font recognition and does not introduce new matter.

Respectfully Submitted,

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CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelop addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 4 day of November 2004.

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